

REMARKS

This is in response to the Office Action mailed on January 11, 2005.

Claims 17, 22, 26, 31, 34, 35, 41, 46, and 53 are amended. Claims 17-19, 22, 23, 25-27, 29, 31, 32, 34-37, 39-48, 50, 52, and 53 remain pending in this application.

Independent claims 31, 41, and 53 are amended for clarity.

Further, independent claims 17, 22, 26, 31, 34, 35 and 41 are amended to substitute "vertically aligned" with "directly above" to clarify the relationship between the gate and the second plate.

§103 Rejection of the Claims

Claims 17-19, 22, 23, 25, 31, 32, 34, 37, 39, 41-46, 48, 52, and 53 were rejected under 35 USC § 103(a) as being unpatentable over Itoh (U.S. 4,920,389) in view of Kanetaki et al. (U.S. 4,906,590).

Applicant respectfully traverses because a *prima facie* case of obviousness has not been made.

Independent claim 52 recites:

a vertical transistor formed on a substrate, the vertical transistor including a first source/drain region, a body region, and a second source/drain region vertically aligned with the first source/drain region and the body region;

a trench capacitor including first plate being formed integrally with the second source/drain region, and a second plate formed in a trench that surrounds the first plate, the first plate having an etch-roughened surface, the second plate having top surface; and

a word line for activating the vertical transistor, the word line being formed above the top surface of the second plate

Applicant is unable to find in Itoh and Kanetaki et al. all of the elements recited in claim 52. For example, Applicant is unable to find in Itoh and Kanetaki et al. a second plate having a top surface and a word line being formed "above" the top surface of the second plate.

Itoh teaches a device having a structure different from the structure of the device claimed in claim 52. Itoh shows in FIG. 8(k) a device having a first electrode or first plate 202 surrounded by a second electrode or second plate 216. Second plate 216 of Itoh has a top surface

abutting an insulating layer 218. Itoh further shows a gate 234 in FIG. 8(k). However, gate 234 of Itoh appears to be "below" the top surface of second plate 216. In contrast, claim 52 recites, among other things, a word line or a gate formed "above" the top surface of the second plate. Accordingly, Applicant requests that that rejection of claim 52 be reconsidered and withdrawn and that claim 52 be allowed.

Independent claim 53 recites, among other things, a plurality of word lines, each of the word lines being formed "above" a top surface of the second plate of trench capacitor. As represented above in claim 52, Applicant is unable to find in Itoh and Kanetaki et al. a second plate having a top surface and a word line being formed "above" the top surface of the second plate. Accordingly, Applicant requests that that rejection of claim 53 be reconsidered and withdrawn and that claim 53 be allowed.

Independent claim 17 recites, among other things, a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Applicant is unable to find in Itoh and Kanetaki et al. a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Accordingly, Applicant requests that that rejection of claim 17 and dependent claims 18, 19, and 46 be reconsidered and withdrawn and that claims 17-19 and 46 be allowed.

Independent claim 22 recites, among other things, a second plate surrounding a first plate, and a gate being "directly above" the second plate. Applicant is unable to find in Itoh and Kanetaki et al. a second plate surrounding a first plate, and a gate being "directly above" the second plate. Accordingly, Applicant requests that that rejection of claim 22 and dependent claims 23 and 25 be reconsidered and withdrawn and that claims 22, 23, and 25 be allowed.

Independent claim 31 recites, among other things, a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Applicant is unable to find in Itoh and Kanetaki et al. a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Accordingly, Applicant requests that that rejection of claim 31 and dependent claims 32, 37, and 48 be reconsidered and withdrawn and that claims 31, 32, 37, and 48 be allowed.

Independent claim 34 recites, among other things, a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Applicant is unable to

find in Itoh and Kanetaki et al. a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Accordingly, Applicant requests that that rejection of claim 34 and dependent claim 39 be reconsidered and withdrawn and that claims 34 and 39 be allowed.

Independent claim 41 recites, among other things, a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Applicant is unable to find in Itoh and Kanetaki et al. a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Accordingly, Applicant requests that that rejection of claim 41 and dependent claims 42-44 be reconsidered and withdrawn and that claims 41-45 be allowed.

Claims 26-27, 29, 35, 36, 40, 47, and 50 were rejected under 35 USC § 103(a) as being unpatentable over Itoh (U.S. 4,920,389) in view of Kanetaki et al. (U.S. 4,906,590) as applied to claims 17-19, 22-23, 25, 31-34, 37-39, 41-46, and 48-49 above, and further in view of Wahlstrom (U.S. 5,396,452).

Applicant respectfully traverses because a *prima facie* case of obviousness has not been made.

Independent claim 26 recites, among other things, a second plate surrounding a first plate, and a gate being "directly above" the second plate. Applicant is unable to find in Itoh, Kanetaki et al., and Wahlstrom a second plate surrounding a first plate, and a gate being "directly above" the second plate. Accordingly, Applicant requests that that rejection of claim 26 and dependent claims 27, 29, and 47 be reconsidered and withdrawn and that claims 26, 27, 29, and 47 be allowed.

Independent claim 35 recites, among other things, a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Applicant is unable to find in Itoh, Kanetaki et al. , and Wahlstrom a second plate surrounding at least a portion of a first plate, and a gate being "directly above" the second plate. Accordingly, Applicant requests that that rejection of claim 35 and dependent claims 36, 40, and 50 be reconsidered and withdrawn and that claims 35, 36, 40, and 50 be allowed.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE

Serial Number: 09/467,992

Filing Date: December 20, 1999

Title: CIRCUITS WITH A TRENCH CAPACITOR HAVING MICRO-ROUGHENED SEMICONDUCTOR SURFACES

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Dkt: 303.389US2

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at (612) 373-6969 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

LEONARD FORBES ET AL.

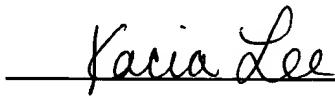
By their Representatives,

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Date March 10, 2005 By 
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop AF, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 10 day of March, 2005.

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